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BRITISH COLUMBIA SYRPHIDÆ, NEW SPECIES AND ADDITIONS TO THE LIST.

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In a former paper (CAN. ENT., Vol. XXXVI, Aug.-Sept., 1904) the writer recorded seventy-eight species in this family of Diptera for British Columbia, and suggested that a complete list would probably include twice that number. Undoubtedly that estimate was far too small, if the number of species which have been added in three years by a little sporadic collecting is any criterion. With the present additions the list is swelled to more than one hundred and twenty-five. With the exception of ten species of my own collecting not recorded in my former paper on account of uncertainty of determination, and nine species added by Messrs. Currie and Dyar, of the U. S. National Museum, the material for this additional list has been taken by local entomologists. Especial reference must be made to the excellent work of Prof. R. V. Harvey, of Queen's School, Vancouver, to whose careful collecting twenty-two of the additions are due. The remainder were taken by Messrs J. W. Cockle, of Kaslo; R. S. Sherman, of Vancouver, and A. W. Hanham. In 1906 Messrs. Harvey and Sherman made a tour through the Hope Mts. and along the Niclum River, securing a fine lot of specimens. In 1903 Messrs. H. G. Dyar, R. P. Currie and A. N. Caudell, of the U. S. National Museum, collected in the Kootenay country, and incidentally took forty-one species of Syrphidae and added nine species to the B. C. list. Mr. D. W. Coquillett has identified this collection, and very kindly turned over the results to me for publication in the following list. The species resting entirely on his identification are so accredited in the list. My thanks are due to Mr. Coquillett for permission to study carefully the collection of Syrphidae, containing many of the type specimens, in the National Museum.

1. *Microdon tristis*, Loew.

The form *tristis* taken at Kaslo, June 5, 1906, by R. P. Currie, and again by J. W. Cockle on June 5, 1906. The form *cothurnatus* was recorded in our previous list.

2. *Microdon viridis*, Townsend.

Ainsworth, July 11, 1903, by R. P. Currie, and Vancouver, June 11, 1904, by R. V. Harvey.

3. *Microdon marmoratus*, Bigot.

A single specimen taken at Vernon, Aug. 14, 1904, by R. V. Harvey.

4. *Chrysotoxum ypsilon*, Williston.

Kaslo, June 5, 1903, by H. G. Dyar. (Identification by Coquillett.)

5. *Pipiza pisticoides*, Williston.

Taken at Kaslo by Mr. Currie on various occasions ranging from June 12 to July 20, and by Mr. Cockle, June 30, 1906.

6. *Pipiza nigripilosa*, Williston.

A single male specimen taken at Vancouver, June 21, 1904, by Harvey, differs from eastern specimens in having the eyes dark pilose instead of light pilose, but otherwise the agreement is very close.

7. *Pipiza quadrimaculata*, Panzer.

Five specimens taken at Vancouver, July 2, 1906, by R. V. Harvey and R. S. Sherman. This European species has not been recorded from North America until very recently. In "Psyche" for August, 1907, Mr. C. W. Johnson notes its capture at North Mountain, Penn., and Mt. Greylock, Mass. The species thus evidently furnishes another example of circumpolar distribution to be added to the already long list among the Syrphidae. It is easily distinguished from other American species of the genus by the two interrupted yellow cross-bands on the abdomen, forming the four spots which suggest the specific name.

8. *Chilosia chalybescens*, Williston.

Grouse Mt., July 1, 1904, one specimen by R. V. Harvey.

9. *Chilosia occidentalis*, Williston.

Two specimens by R. V. Harvey, one from the Hope Mts., July 24, 1906, the other at Vancouver, June 22, 1906.

10. *Chilosia hoodiana*, Bigot.

One female specimen from Similkameen, July 20, 1906, by R. V. Harvey, I place here, though it shows some differences. The yellow of the knees ("geniculis tibiarumque basi, fulvis," Bigot) is almost wanting, and the fourth abdominal segment is entirely shining.

11. *Chilosia alaskensis*, Hunter.*

Port Renfrew, July 3, 1901, and Glacier, July 20, 1901, R. C. Osburn; Vancouver, May 6, 1905, R. V. Harvey, and June 5, 1906, R. S. Sherman.

12. *Chilosia pallipes*, Loew.

Four specimens, all females, have the characters given by Loew for the species, "humeri lutei, scutellum luteum" (Cent. Quarta, No. 70). Glacier, Aug. 20, 1902, R. C. Osburn; Goldstream, July 19, 1904; and Similkameen, July 20, 1906, R. V. Harvey.

I must admit that I am not able to separate from this species by any definite characters a much larger number of specimens, of which a majority, and notably all the males, fall unquestionably into *C. tristis*, Loew. Williston at one time placed *tristis* as a synonym of *pallipes* (Syn. N. A. Syrphidae, p. 41), but later retracted his statement (*ibid.*, appendix, p. 293). I am strongly inclined to the opinion that he was right in the first place, as the humeral and scutellar lutescent markings are extremely variable in extent in my specimens, and in some cases are entirely wanting. The legs also vary in the amount of yellow, and the shape of the first posterior cell may show variation even between the two wings of the same specimen. It is a very significant fact also that the male of *pallipes* has never been described. Pending more complete study of this question, however, I enumerate the following under *tristis*:

13. *Chilosia tristis*, Loew.

Seventeen specimens in all taken as follows: Port Renfrew, July 6, 1901, and Field, July 19, 1901, R. C. Osburn; Goldstream, July 19, 1904; Vancouver, Sept. 24, 1904, and Similkameen, July 20, 1906, R. V. Harvey. Taken also at Kaslo, June 10 and July 2, 1903, R. P. Currie. (Banff, Alberta, July 17, 1901, R. C. Osburn.)

14. *Chilosia nigripennis*, Williston.

Port Renfrew, June 29, 1901, R. C. Osburn, and Vancouver, May 27, 1905, R. V. Harvey.

*It is worthy of note that this species has recently been shown to be the cause of the timber blemish known as "Black Check" in the Western Hemlock. The young larva enters an opening made in the bark by a tiny bark beetle (*Hylesinus* sp.), and develops beneath the bark, forming an unsightly scar. Another species, *C. hoodiana*, attacks the White or Lowland Fir in the same manner. These facts put a somewhat different economic aspect on the Syrphidae as a whole, as they have hitherto been considered entirely harmless or beneficial. For the work and interesting life-histories of these two Chilosias see Circular No. 61, U. S. Dept. Agriculture, entitled "Black Check in the Western Hemlock," by Mr. H. E. Burke.

15. *Chilosia plumosa*, Coquillett.

A single specimen taken by the writer at Glacier, Aug. 20, 1901, seems, after comparison with the type, to belong here without question. The species was described from Ormsby Co., Nevada, and has not to my knowledge been recorded elsewhere.

16. *Chilosia cyanea*, Hunter.

Port Renfrew, July 5, 1901, one specimen taken by the writer.

17. *Chilosia* sp.

Two female specimens taken at Hope Mts., July 19, 1906, and at Similkameen, July 20, 1906, by R. V. Harvey. These may be the undescribed female of some species of *Chilosia* already known from the male, but I am not able to fit them in anywhere. I hesitate to give them a new name in such a difficult group. The antennæ are plumose and dark in colour; scutellum with bristly hairs; tubercle much as in *C. tristis*. body metallic-black, with very short yellowish pile; legs black, yellowish at the knees; length, 7 to 8 mm.

18. *Chilosia* sp.

One female taken at Field, July 18, 1902, by the writer. The antennæ are lacking, and I cannot place it in any species known to me.

19. *Melanostoma coerulescens*, Williston.

Kaslo, July 2, 1903, R. P. Currie. (Determined by Coquillett.)

20. *Melanostoma trichopus*, Thompson.

Nicolum River at Hope, July 14, 1906, and Vancouver, July 7, 1906. Two specimens, by R. S. Sherman.

(*Melanostoma concinnum*, Snow.

Banff, Alberta, July 17, 1901. One specimen by R. C. Osburn.)

21. *Syrphus glacialis*, Johnson.

Vancouver, March, 9; Mission, April 4, and Hope Mts., July 19, 1906, by R. V. Harvey. The species was described from Alaska.

22. *Syrphus geniculatus*, Macquart.

Grouse Mt., July 3, 1904, and Vancouver, June 16, 1906, R. V. Harvey.

23. *Syrphus genualis*, Williston.

Glacier, Aug. 20, 1902, R. C. Osburn, and Kaslo, June 4, 1904, J. W. Cockle.

24. *Syrphus quinquelimbatus*, Bigot.

A single male specimen taken at Mt. Cheam, Aug. 6, 1903, by R. V. Harvey, and one female in the U. S. National Museum from Mr. Coquillet's collection, taken by W. H. Danby, and labeled merely "Br. Columbia."

This species was described from a single female specimen from California (Ann. Soc. Ent. France, 1884, 91), and has not since been mentioned. The male taken by Harvey is sufficiently like the female in the National Museum, and agrees well enough with Bigot's description, so that there can be little doubt as to its identity. The last two abdominal bands on the posterior margins of segments 4 and 5 are wanting in the male. This is the only important difference in the sexes.

25. *Syrphus disjectus*, Williston.

Two female specimens taken by Harvey, Hope Mts., July 18, 1906, compare well with Williston's description of the male. They also agree with the female which Snow (Notes and descriptions of Syrphidae, Kansas Univ. Quart., July, 1892) lists from Colorado, in having whitish pile and light-coloured lateral margins on the thorax.

26. *Syrphus insolitus*, sp. nov. (Fig. 1.)

Male.—Face, front and cheeks entirely shining bronze-black, with no indication of yellowish; with black pile on the face, front and vertex. Face and front rather swollen, the former nearly perpendicular below the antennae; tubercle broadly rounded, not prominent. Antennae dark brown, yellowish below on second and third joints. Occiput with black pile above and yellowish pile below. Thorax bronze-black, with light yellow pile on the sides and black and yellow mixed on the disc (in one specimen the whole disc is covered with black pile, and that on the sides is reddish). Scutellum yellow, with dark reflections, the extreme base black. Abdomen: first segment black, shining; segments 2, 3 and 4 opaque-black except the outer posterior angles, which are shining black, yellow as follows: a pair of spots on the middle of segment 2 attenuated at both ends and reaching forward at the outer ends to the margin, bands of the third and fourth segments entire, attenuated at their ends and nearly or quite reaching the lateral margins; segment 4 narrowly yellow on the posterior margin, and segment 5 with an inconspicuous yellow spot on the anterior outer angle. Hypopygium shining black. Legs: first and second pairs yellow, bases of the femora black; third pair dark, the knees lighter. Halteres yellow. Wings nearly transparent, slightly tinged with dark, stigma dark brown. Length 7 to 8 mm. (*insolitus* = unusual).

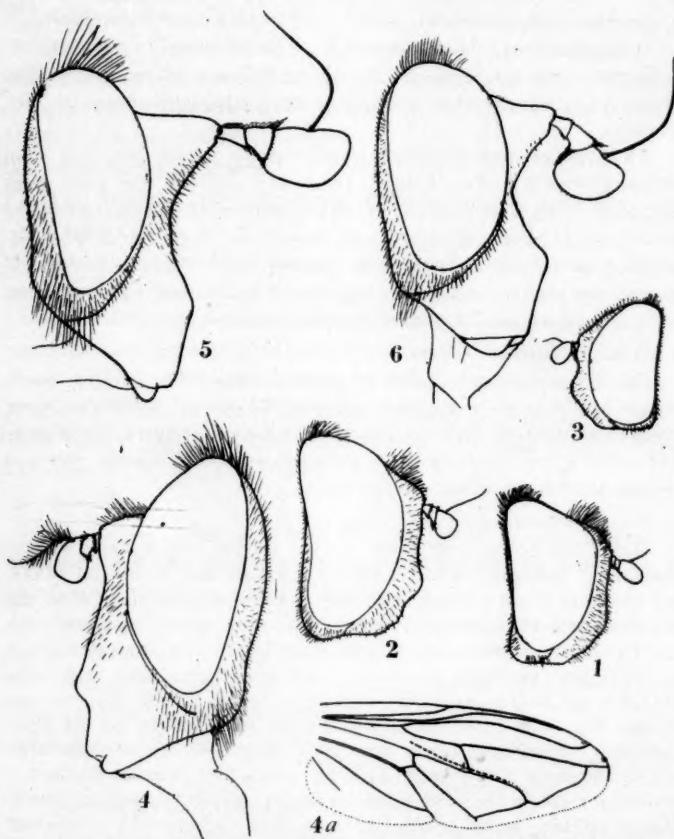


FIG. 1.—1, *Syrphus insolitus*, n. sp., Head of male; 2, *Syrphus conjunctus*, n. sp., Head of male; 3, *Xanthogramma tenuis*, n. sp., Head of female; 4, *Arctophila Harveyi*, n. sp., Head of male; 4a, wing of female; 5, *Sphecomyia occidentalis*, n. sp., Head of male; 6, *Sphecomyia nasica*, n. sp., Head of male.

Three males taken at Vancouver, April 13, 1906, by Mr. R. V. Harvey.

The species is easily distinguished from *S. gracilis*, Coquillett, which also has a shining black face, by the presence of three yellow cross-bands on the abdomen instead of one, by the yellow anterior legs and by the facial tubercle, which is low instead of prominent.

27. *Syrphus conjunctus*, sp. nov. (Fig. 2.)

Male.—Face dark yellow, descending almost perpendicularly to the small tubercle, cheeks shining black, the black continued around in front and up over the tubercle to the middle of the face, but interrupted behind the mouth on the oral margin by yellow; front and vertex black, the former with yellow pollen except near the antennæ. Pile of face, front and vertex black. Antennæ dark, third joint lighter below. Occiput with yellow pile. Thorax shining bronze-black, with some yellowish pollen on the disc, and with yellow pile, Scutellum large, waxy-yellow, pile yellow, with a fringe of dark hairs on the margin. Abdomen black, segment 1 shining, 2 opaque, 3 opaque except the lateral borders, 4 mostly shining, 5 and the hypopygium entirely shining; three broad yellow bands occupying the anterior half of the segments, on segment 2 the band is interrupted and the spots forming it are rounded at their inner ends and attenuated at their outer ends, where they attain the margin of segment; on segments 3 and 4 the cross-bands are complete, but are so deeply incised behind at the middle that they appear at first glance to be interrupted, each half evenly rounded behind, and attenuated at the outer end, where it attains the margin of the segment; segments 4 and 5 are margined with yellow posteriorly, and the outer anterior angles of 5 are yellow. Pile of abdomen mostly black, but yellow on the first two cross-bands. Anterior and middle legs reddish-yellow, black at the extreme base of the femora, and the tarsi infuscated; hind legs reddish-brown; a broad dark band covers most of the femur, and the distal three-fourths of the tibia and the tarsi dark. Halteres yellow. Wings hyaline, slightly infuscate anteriorly, stigma brown.

Length, 8 mm. (*conjunctus* = joined, referring to the apparently interrupted abdominal cross-bands).

Described from one male specimen taken at Hope, on the Nicolum River, July 14, 1906, by R. V. Harvey.

Evidently related to *S. macularis*, Zetterstedt, but differs in having the eyes bare, and the black of the face and legs much more restricted, while abdominal bands 2 and 3 are incised but not interrupted.

28. *Syrphus* sp.

A somewhat teneral female, Glacier, Aug. 20, 1902, R. C. Osburn, I am not able to place in any species known to me.

29. *Xanthogramma divisa*, Williston.

One female taken by R. V. Harvey at Vernon, Aug. 14, 1904.

30. *Xanthogramma tenuis*, sp. nov. (Fig. 3.)

Female.—Face, cheeks and oral margin yellow, the yellow continued above on the sides of the front to the vertex. Vertex and middle of the front nearly to the antennae bronze-black. Pile very fine and delicate, that of the face whitish, of the front and vertex black. The contour of the face below the antennae is straight to the tubercle, which is rounded and moderately prominent. Thorax bronze-black, the lateral stripes yellowish, rather obscure; a large obscure whitish patch on the pleura. Scutellum yellow, with dark reflections, the anterior angles blackish. Pile of the thorax and scutellum yellowish, very delicate. Abdomen black, somewhat shining, yellow as follows: a spot on each side of segment 1, cross-bands on the anterior part of segments 2, 3, 4 and 5 interrupted at the middle and reaching the margin broadly; segments 5 and 6 very narrowly yellow on the posterior border. Legs yellow, a broad dark ring on the hind and middle femora and tibiae, and the hind tarsi infuscated. Halteres yellow. Wings hyaline, stigma yellow.

Length, 7 mm., a weak-looking, delicate species (*tenuis* = slender).

One specimen taken by Mr. R. V. Harvey in the Hope Mts., July 27, 1906.

This species resembles most *S. emarginata*, Say, but differs from it in the facial contour, the interrupted abdominal cross-bands, the smaller size and more slender form.

31. *Toxomerus (Mesogramma) boscii*, Macquart.

Kaslo, June 11, 1903, H. G. Dyar. (Identified by Coquillett.) This species, formerly known only from south-eastern North America, has recently been recorded by Chagnon from Montreal, and by Washburn from Minnesota.

32. *Hammerschmidtia ferruginea*, Fallen.

Kaslo, June 15, 1903, R. P. Currie, and June 14, 1906, J. W. Cockle. The specimen taken by Mr. Cockle is much darker than any others I have seen, so much so that its general aspect is dark instead of reddish. On closer inspection in strong light the ground colour appears through the darker pigment. A specimen from Ft. Morrison, Colorado, in the U. S. National Museum, is intermediate in colour.

33. *Brachyopa notata*, O. Sacken.

April 13, 1906, at Vancouver, ten specimens taken at cherry bloom by R. V. Harvey; April 28, 1906, R. S. Sherman.

34. *Arctophila Harveyi*, sp. nov. (Figs. 4, 4a.)

Male.—Face yellow, with fine yellow pile; a shining black stripe descends from the base of the antennæ over the tubercle, which is quite small, to join with the black shining oral margin and cheeks. Front black, thickly whitish pollinose, and with short black pile. Antennæ reddish, third joint quadrangular, the corners rounded; arista basal, plumose. The antennæ are inserted on black ground. Vertex black, shining, with black pile. Thorax and scutellum black, shining, covered with a thick coat of pile, which is yellowish on the pleura and anterior two-thirds of the thoracic dorsum, but jet black on the posterior third and the scutellum; a fringe of light pile projects from underneath the scutellum behind. Abdomen black, shining, tip of the fourth segment margined with red; pile of the second segment black, that of the third mixed black and yellowish, that of the remaining segments yellowish. Legs black, knees reddish-brown, tips of tibiæ and basal joints of tarsi lighter; pile of legs abundant, mostly black. Halteres piceous. Wings hyaline, with an ill-defined, dilute brownish cloud about the base of the submarginal cell; stigma yellow; third vein entirely straight.

Female.—Similar to the male in all essential respects. The pile of the front and vertex is yellow, intermixed with a few black hairs on the vertex. On the thorax the yellow pile extends back almost to the scutellum. The legs are slightly lighter in colour.

Length, 13 to 15 mm.

Described from one male taken on Mt. Cheam, Aug. 11, 1903, and one female from Hope, July 12, 1906. Both specimens were taken by Mr. R. Valentine Harvey, after whom I take pleasure in naming the species.

The genus *Arctophila* has heretofore been known in America by only one species, *A. flagrans*, O. S., and in Europe by two species, *A. bombiformis*, Fallen, and *A. mussitans*, Fabricius. From all of these *A. Harveyi* differs in having the third vein entirely straight. Otherwise it conforms closely to the generic description. *A. Harveyi* can be distinguished at once from *flagrans* by the black pile of the thorax and by the black facial stripe.

35. *Eristalis Meigenii*, Weidemann.

One female from Vernon, Sept. 9, 1904, and a male from the same locality, Aug. 15, 1906, both taken by R. V. Harvey.

36. *Helophilus similis*, Macquart.

Kaslo, June 3, 1903, H. G. Dyar, and July 20, 1903, R. P. Currie; Vernon, Aug. 15, 1904, R. V. Harvey.

37. *Helophilus conostomus*, Williston.

One specimen taken by Harvey at Vernon, Aug. 12, 1904.

38. *Helophilus porcus*, Walker.

As far as I am aware this species has never been recorded since Walker described it (List, etc., III, 551), and recorded it for the Hudson Bay Territory. Osten Sacken (Cat. Dipt., 250, note 235) says: "It is represented in the British Museum by two (male and female) specimens. I have never seen it elsewhere." There are in the U. S. National Museum three unrecorded specimens, one male from Ottawa, Canada, and a male and female from North Mt., Pennsylvania, taken June 8 by Mr. C. W. Johnson. The specimen in my possession, from British Columbia, was taken at Kaslo by Mr. J. W. Cockle (date not given). The species, though apparently rare, seems to be of wide distribution through boreal America.

39. *Merodon equestris*, Fabricius.

This species has been taken previously a number of times in America, but it has always been assumed that it was in each case an accidental introduction from Europe in plant bulbs in which the larvae live. The occurrence of the species in several localities, and especially the number taken in British Columbia, make it seem certain that it properly belongs to our North American fauna. Mr. Harvey has taken numerous specimens at Vancouver, frequenting especially the flowers of the Salmon-berry (*Rubus spectabilis*).

40. *Xylota marginalis*, Williston.

A male of this species taken by Harvey at Duncan, April 19, 1906, agrees in all respects with Williston's type from the White Mts. of New Hampshire. The species has also been taken in New York, but never before in the west.

41. *Ferdinandea (Chrysoclamys) croesus*, O. Sacken.

A male of this fine species was taken by Harvey at Victoria, June 8, 1906, on a flower of the Yellow Hawk-weed (*Hieracium*). The species has previously been known from Utah and Washington southward.

42. *Criorhina Coquilletti*, Williston.

One female taken by Mr. J. W. Cockle at Kaslo, April 30, 1906.

The female lacks the bronze of the thorax and abdomen, and has bunches of yellow pile on the anterior "corners" of the abdomen, and is also somewhat larger, measuring 13 mm. Otherwise it agrees closely with Williston's description of the male from southern California. The U. S. National Museum has a specimen from Hoquiam, Washington, collected by Mr. Burke.

43. *Criorhina armillata*, O. Sacken.

Kaslo, June 18, and Bear Lake, July 21, 1903, R. P. Currie; Vancouver, April 13, 1906, on cherry bloom, by R. V. Harvey.

44. *Brachypalpus sorosis*, Williston.

Kaslo, June 12, 1903, one specimen by R. P. Currie. (Identified by Coquillett.)

45. *Brachypalpus parvus*, Williston.

One male and three females from Quamichan Lake by A. W. Hanham, and one female from Kaslo by J. W. Cockle. These specimens agree closely with Williston's description of the male from Colorado, the only previous record for the species as far as I am aware. The only point of any importance in which they disagree from the description is in the presence of short bristles on the under side of the hind femora, but for that matter so do my specimens of *B. Rileyi*, Williston, from Ohio, so that this is either a matter of variation in both species or else Professor Williston overlooked the point in his descriptions.

The female is similar to the male, but the pile of the body is lighter in colour, and while in the male there are a few black hairs intermixed with the yellow on the vertex and thorax, in the female there is no black pile. The yellow of the legs is more extensive in the female. In size my specimens range from 7 to 10 mm.

46. *Temnostoma aequalis*, Loew.

One male at Kaslo, July 17, 1906, by Mr. J. W. Cockle.

47. *Temnostoma alternans*, Loew.

Kaslo, July 21, 1903, by Mr. J. W. Cockle. (Identified by Coquillett.)

48. *Sphecomyia brevicornis*, O. Sacken.

Three specimens, one male and two females, taken at Kaslo, May 6 and 26, 1905, by Mr. J. W. Cockle. The female, which has not hitherto

been described, agrees with the male in every particular, except, of course, the separation of the eyes. My specimens measure considerably larger than those of Osten Sacken, being 14 to 15 mm. The species has heretofore been known only from California.

49. *Sphecomyia occidentalis*, sp. nov. (Fig. 5.)

Male.—Head shaped about as in *S. brevicornis*, but the tubercle is fuller and more rounded, and the face more concave below the antennæ. Cheeks and oral margin shining black. Face entirely covered with dense yellow pollen, which is continued above around the base of the antennal prominence. This prominence, which is shining black, points forward as in *S. brevicornis*, and is not tilted upward as in *S. vittata*. The antennæ are brownish-black, with a black, bare, basal arista; the first two antennal joints are about equal in length, the third somewhat longer and nearly as broad as long, rounded below and nearly straight above, the upper outer corner being quite angular. Pile of vertex black. Thorax black, shining, with black pile intermixed with some yellow, and with yellowish markings as follows: in front, on either side of the midline is a small spot which is continued backward as a faint line, on the humerus another rounded spot, and on the transverse suture another, an elongate spot above the postalar callosities, and a transverse line in front of the scutellum, which in some specimens is connected with a faint mid-dorsal line; on the mesopleura is an oval spot, and under it on the sternopleura a smaller round spot. The scutellum is entirely black, with black pile above and yellow on the sides. Abdomen black, with yellow bands and yellow pile. The bands are as follows: A rather narrow band on the posterior margin of segments 1 to 4, a broader interrupted band across the middle of the black portion of segments 2 to 4 (on segment 4 of some specimens this band is near the anterior margin of the segment, and it may be connected slightly with the posterior band at the lateral margin); all the bands reach the margin. On the venter there are yellow cross-bands, interrupted at the middle, on the anterior margin of segments 2 to 4. The hypopygium is black, with some yellow pollen and with black and yellow pile. Legs yellowish, the femora all brown except the tip, the posterior pair lighter than the others; tibia with a brownish ring about the middle, most distinct on the anterior pair, sometimes entirely wanting; distal tarsi infuscated. Wings clouded with brownish, especially along the veins, stigma yellowish-brown. Halteres yellow.

Female.—Similar to male in all essential respects. The fifth segment of the abdomen is marked like the fourth. The front is considerably

wider than the vertex, while in the male the eyes are narrowly separated. There is a shining black facial stripe extending rather broadly from the tubercle to the base of the antennal prominence, and extending narrowly above to the insertion of the antennæ, and below to the oral margin, where, however, it is not continuous with the black of the cheeks.

Length, 13 to 14 mm. (*occidentalis* = western).

Described from eight males and one female taken as follows: Glacier, Aug. 21, 1902, R. C. Osburn; Vancouver, May 2, 1903; May 9, 1903 (the female); April 23, 1904; April 28, 1906, and Grouse Mt., July 19, 1903, R. V. Harvey; Vancouver, April 21, 1906, and Mission, April 13, 1906, R. S. Sherman; Hoquiam, Washington, April 29, 1904, H. E. Burke. (The last mentioned was kindly lent me by Mr. Coquillett, of the U. S. National Museum.) Mr. Harvey notes the capture of his specimens on blossoms of *Vaccinium parviflorum*, in company with wasps.

The specimen taken by myself was mentioned in my former list (CAN. ENT., Vol. XXXVI, Sept., 1904, p. 262) as doubtfully belonging to *S. Pattoni*, Will. Since then the study of better material, and especially a comparison with the type specimen of *Pattoni*, show it to be entirely different. The absence of a facial stripe in the male, the entirely black scutellum, and the colour markings of the thorax and scutellum (which appear to be very constant) easily distinguish the species.

50. *Sphecomyia nasica*, sp. nov. (Fig. 6)

Male.—Head a trifle broader than the thorax. Face produced downward, deeply concave below the antennal prominence, the lower part of the face with the tubercle projecting prominently forward and downward. Face and front covered with a dense coat of yellowish pollen, the black ground colour appearing on the forward projecting antennal prominence. Cheeks shining black. Antennæ very short, scarcely more than half of the vertical length of the eye; third joint considerably broader than long, brownish-black, and with a long and rather stout black arista. Vertex shining black, with black pile. Eyes narrowly separated. Thorax black, shining, with short black pile, which is intermixed with yellowish anteriorly, bunches of yellow pile on the pleura and postalar callosities; a distinct yellowish pollinose spot on the humerus, and a fainter one adjoining it above, an oval spot on mesopleura and a rounded one below this. Scutellum entirely bronze-black, with yellow pile. Abdomen slightly narrower than thorax, the sides nearly parallel, black, yellow pilose, and marked with yellow as follows: on segment 1 the shining

black is partly obscured by yellow pollen, segments 2, 3 and 4 each with one cross-band of moderate width, situated somewhat nearer the base of the segment, the band on segment 2 is interrupted at the middle, and does not reach the margin, while the others are entire, and attain the lateral margin. The extreme posterior margin of segment 2 is shining, and also the lateral margins, leaving an H-shaped velvety-black area ; segments 3 and 4 are velvety-black in front of the cross-band and shining behind it. Hypopygium shining black. Venter with yellow cross-bands on segments 2 and 3. Femora black except narrowly at the knees ; tibiæ yellow, with a dark spot on distal half ; the front and middle tarsi have the basal joints yellow and the distal joints dark, the posterior tarsi are dusky, with the distal joints darker. Halteres yellow. Wings brownish, especially toward the costal border.

Length, 13 mm. (*nasica* = referring to the nose).

Described from a single specimen taken in the Hope Mts., July 27, 1906, by Mr. R. S. Sherman.

To include the new species of *Sphecomyia*, I have amended Williston's table (*Synopsis N. A. Syrphidae*, p. 257) as follows :

- 1. Antennæ very long, third joint short *vittata*.
- Antennæ shorter than head 2.
- 2. Scutellum yellow at base ; a complete black facial stripe from antennæ to oral margin 3.
- Scutellum entirely black ; facial stripe wanting in male (there is in the female of *occidentalis* a stripe which is attenuated at both ends) .. 4.
- 3. Yellow cross-bands of abdomen very broad *brevicornis*.
Cross-bands narrow *Pattoni*.
- 4. Abdominal segments 2 to 4 each with two yellow
cross-bands *occidentalis*.
Abdominal segments with only one yellow cross band *nasica*.

ARGYNNIS ASTARTE, DOUBL.-HEW.

BY HENRY SKINNER, M.D., PHILADELPHIA.

This was the butterfly we did not get. Dr. James Fletcher and the writer arrived at Lake Louise, in the Rocky Mountains of Alberta, on the second day of August. One of the insects we were most anxious to obtain was *Argynnis astarte*, described in 1848, and not rediscovered until 1888. Dr. Fletcher said Mr. Bean had taken the species on the

very summit of Mt. St. Piran, so we made the ascent of that peak. When we arrived at the rocky top, the temperature was below freezing and snow was falling and the wind blowing a fearful gale. Dr. Fletcher captured a specimen of *Chionobas Beanii* at a time when the sun shone through a break in the clouds. A butterfly came toward me as though it had started from the South Pole, and when I raised my net to make a stroke it turned and made for the North Pole, and, as far as I know, never stopped until it reached there. I feel sure it was *astarte*. The weather continued bad during our brief stay in the mountains, and we did not get this interesting species. It is said in a general way that the species is found about the tops of the Rocky Mountains of Canada, and this article is a contribution towards our knowledge of its habitat. It is quite interesting, and perhaps important, to know the exact places where species are found. Mr. Bean says it occurs on a mountain, three miles south-west of Laggan, 8,500 ft. altitude, and on a low smooth mountain directly north of Laggan. He also says it occurred at Lake Agnes in 1892.

Mrs. Nicholl says: "Everywhere *Brenthis astarte* was to be seen, though not generally to be caught, on every peak over 8,000 ft." The males haunt the summits, and the females are to be found on the highest grassy slopes. Mrs. Nicholl records it from Glacier Crest, Selkirk Mountains. Mrs. Chas. Schaeffer recently presented two specimens to the Academy of Natural Sciences of Philadelphia, which were taken on Mt. Athabasca (7,200 ft. alt?). She says it has also been taken on Mt. Temple, above the saddle. Mr. Wolley Dod records it from Devil's Lake, near Banff. Mr. N. Sanson captured a specimen on Sulphur Mountain at Banff. From the above records, where should a collector go to get the species? It is no joke to climb these mountains, and one cannot step from the top of one to the top of another on the basis that they are flying around nearly all the peaks over 8,000 ft. altitude. Some of the localities mentioned are exact and some are not. It would be far better to give the names of the peaks where any butterfly is found, and if possible the altitude of the place of capture. Mr. Bean gives a very interesting account of the altitudes where he worked, but does not name the peaks. Perhaps they were not named when he was at Laggan.* I wish to pay tribute to the valuable work done by Mr. Bean in making known the butterfly fauna of this region.

*This was actually the case with most of the mountains at Laggan in 1890, when Mr. Bean rediscovered *A. astarte*.—[ED. C. E.

NOTE ON *PLUSIA PRECATIONIS* AT PETUNIA BLOSSOMS.

BY A. F. WINN, WESTMOUNT.*

During the past summer the Westmount Park gardener devoted to Petunias a circular bed about 20 feet in diameter, and knowing the fondness of the Plusias for the blossoms of this plant, I paid a little attention to it, my original intention being to see how many species I would find visiting it.

The flowers were of the old-fashioned single kinds, small blossoms, but hundreds of them, and were of three colours: first, a deep magenta or purple; second, a pale, washed-out looking variety of same, and third, pure white.

My first visit was on August 17, before dusk, and I had not long to wait, as while it was still quite light two Plusias appeared and quickly took a head-first plunge into the funnel-shaped blooms. They were easily boxed, and proved to be both *P. precationis*. A number of others soon followed, flying about among the blossoms, and I was struck with an unexpected circumstance, that they were all selecting the dark-coloured blooms. This seemed remarkable, as white colour in flowers has been considered a sort of special guide for crepuscular and night-flying moths. The colour of the Plusias matched so well that of the blooms in the now fading light, that I wondered whether, when darkness actually set in, the moths would adjourn to the white blooms, so walked around and around the bed, watching developments, doubtless to the amusement or mystification of the park frequenters. After a while a moth fluttered over the bed, and went boldly into a white blossom. I tried to box it, but was in too great a hurry and missed, but saw that it was no Plusia. Next moment I had it, or another — *Cucullia intermedia*. There were soon lots of them, and without exception they selected the white blooms, while the Plusias kept to the dark ones, and long after it was so dark that one could see only the swaying blossoms by the light of the nearest street lamp, they kept to their respective colours. The result of the evening's catch was 67 *Plusia precationis* and 23 *Cucullia intermedia*, and nothing else. Not a single moth was seen to get into the tube of any of the washed-out coloured blossoms, though they were continually fluttering past. On several other evenings up to the 8th September, the same two moths were the sole visitors of the Petunias.

*Read before Montreal Branch, Entomological Soc. of Ontario, Nov. 9, 1907.

NEW SPECIES OF COLORADO APHIDIDÆ, WITH NOTES UPON THEIR LIFE-HABITS.

BY C. P. GILLETTE, FORT COLLINS, COLORADO.

(Continued from Vol. XXXIX, page 396.)

Myzus Braggi, n. sp. (Plate 1, figs. 1, 2, 3).

A beautiful pale yellowish or greenish-yellow louse, with bluish-green markings; upon Canada thistle, *Carduus arvensis*.

Winged Male (Fig. 3).

Described from specimens taken at Fort Collins, Colo., Oct. 26, 1906.

General colour light yellow, or greenish-yellow. Head, thorax, antennæ, tarsi and distal ends of tibiæ black or blackish. The dorsum of the abdomen has black transverse bands on all of the segments, except the first two. Femora black in distal two-thirds, but light near the coxæ. The pleuron of the mesothorax, the coxæ, more or less of the cornicles, about four or five spots on either lateral margin of the abdomen, the beak except at base, the subanal and subgenital plates, and the nervures of the wings, dusky brown to blackish in colour. Eyes dark red; cauda pale yellow; cornicles .40 mm. long, slender, cylindrical, straight, or very slightly curved, and with flange at free end. Length of body, 1.80 mm.; length of wing, 3 mm.; length of antennæ, 2.30 mm. Prothorax without lateral tubercles, a slight tubercle on vertex of head for ocellus. Joints of antennæ measure about as follows: III .51, IV .43, V .37, VI .11, and VII .90 mm. The sensoria are abundant on segments three, four and five. They are oval and placed with their greater diameters across the antennal segments. A cluster of about six or eight sensoria are placed at the end of segment six.

Winged Viviparous Female (Fig. 1).

Described from specimens taken at Fort Collins, Colorado, Oct. 5, '07.

In general appearance hardly unlike the male described above, but differs by being a little larger (about 2 mm. long), by having the black colour upon dorsum of the abdomen in a solid rectangular patch on joints 3, 4 and 5, by having a transverse band on joint 6, and by lacking the black tip to the abdomen, but with subgenital plate dusky. Sensoria abundant on joints 3, 4 and 5 as in the male; cornicles slender, a little curved and .50 mm. long.

Apterous Viviparous Female (Fig. 2).

The ground colour of this female is very pale greenish-yellow, with a broad but more or less obscure dark stripe of green extending over the thorax and abdomen about midway between the median and lateral lines

of the dorsum upon either side. In some specimens, however, the green colour is quite distinct and pronounced. The whole body, in some specimens, is tinged more or less distinctly with flesh colour, the head being the lightest. The distal portions of the antennæ, tibiae, cornicles, beak and the entire tarsi infuscated; eyes dark red; entire length of body 2 mm.; antennæ 2 mm. Joints of antennæ about as follows: I and II together .10 mm.; III .40, IV .34, V .31, VI .10, and VII .80 mm. Cornicles .70 to .80 mm. long, gently curved in form and quite slender. Style rather long, upturned. The body has many capitate hairs, but there are none of these hairs upon the antennæ or legs; the tubercles for the antennæ are quite prominent and slightly gibbous. The first joint of the antenna is much larger than the second, and strongly gibbous on the inner side, giving the appearance of receiving joint 2 upon the outer side. There is a slight frontal prominence bearing two capitate hairs; prothoracic tubercles wanting. The lice have been so numerous upon the thistles as to utterly kill many of them.

Apterous Oviparous Female.

Mr. Bragg and I have been searching for the oviparous females for at least two weeks, and those obtained to-day (Oct. 5, '07) are the first that we have noticed this season, although I saw a few eggs upon thistles one week ago. There certainly is not more than one oviparous female to 100 males upon the plants at this time. The eggs are bright yellow in colour when first deposited, but gradually change to black. I am able to find but very few of these upon the stems and leaves of the thistles, but they are scattered in small numbers over the plants. This form closely resembles the apterous viviparous form. A technical description has not been made.

The Pupa.

The pupæ are light greenish-yellow in general colour, with two longitudinal dashes running over the mesothorax, with a large green spot on either side of the first segment of the abdomen, and with a broken longitudinal line of green on either side of the dorsum of the abdomen extending over segments three, four, five and six. This green colour is a very conspicuous marking upon the light background of the general colour of the pupa.

I find that my winged males for a time retain the green colour markings that are so prominent on the apterous females and the pupæ. After a few hours' exposure to the daylight these winged males lose the green colouring and take on the dark colouring of the abdomen mentioned above. All of the individuals seem now (Oct. 5) to be acquiring wings,

and, so far as I can find, all are becoming males, although I find an occasional yellowish-green egg that probably is being deposited by oviparous females upon the stems of the thistle.

The Canada thistle upon which this louse has been found occurs upon a small area in the suburbs of Fort Collins, where the seeds were introduced some twenty years ago. I have never seen the thistle in the surrounding country, and neither Mr. Bragg nor myself have ever found this louse upon other food-plants, but it seems probable that such must occur here. The lice have been most abundant during the month of October, and we have not seen them during the spring or summer months, though carefully searched for. The lice are rather broad and flat, and so near the colour of the leaves of the thistle that they are seen with difficulty unless very numerous.

Myzus vincae, n. sp. (Plate 1, figs. 4, 5).

Alate Viviparous Female (Fig. 5). Type specimens taken at Fort Collins, Nov. 11, 1907, upon *Vinca* sp. in the College greenhouse.

General colour pale greenish-yellow. Head, antennæ, transverse band on pronotum, mesothorax above, laterally and beneath; a transverse band upon each segment of the abdomen dorsally, spots along lateral margins of the abdomen, cauda, subanal and subgenital plates, tarsi, distal ends of femora and tibiæ, and beak, except at base, black or blackish; eyes dark red. Upon segments 3 to 5 of the abdomen the bands unite to form a large blotch.

Body, 1.70 mm.; antenna, 2.37 mm.; cornicles, .29 mm.; wing, 3.20 mm.; cauda, .13 mm. Antennal joints: III .50, IV .45, V .37, VI .15, VII .73 mm. Cornicles cylindrical, with distinct flange at apex; 3rd joint of antenna with about 15 sensoria that are scarcely tuberculate; no sensoria on joint 4; cauda tail-like, upturned; beak barely reaching 3rd coxae; antennæ upon moderate frontal tubercles, the inner sides gibbous, as are the inner sides of the first joints of the antenna; lateral tubercles of prothorax wanting. A few red specks, the eyes of embryo lice, can usually be seen over the abdomen. In some examples segments 2, 3, 4 and 5 of the abdomen have black transverse dashes near their lateral margins.

Apterous Viviparous Female (Fig. 4).

Colour light yellowish-green, with black markings above and dark red eyes; cauda concolorous with body, antenna, legs and cornicles light yellowish-brown; distal ends of joints 3, 4 and 5 and all of joints 6 and 7 of antenna and extreme ends of cornicles and tarsi black; distal ends of tibiæ slightly infuscated.

Length of body, 1.90 to 2.10 mm.; antenna, 2.70 to 2.80 mm.; cornicles, .45 mm., cylindrical or slightly enlarged towards base, slightly

bent, and the distal end with a rather strong flange. Joints of antenna about as follows : III .65, IV .52, V .40, VI .18, VII .79 mm. Antennal tubercles strongly gibbous, and first joints of antennæ moderately gibbous; cauda conical and upturned. A few of the eyes of embryos usually show as bright red specks in the abdomen. No dark markings on ventral surface.

The black coloration above consists of rather broad irregular transverse bands, one for each segment of the thorax and one each for joints 2, 3 and 4 of the abdomen, the last being broadest and the only one that extends across the middle of the dorsum, the others being cut by a median light portion concolorous with the rest of the body.

It seems probable that some of the past references to *M. dianthi* are really of this species.

I hesitate to call this a new species, but have been unable to find a description that will fit it. It is closely allied to the *persicae*, *dianthi*, *achyrantes* group, especially in the alate form.

Mr. Bragg has taken this louse upon liliaceous plants, asparagus, asparagus fern, *Aquilegia* and *Rumex* sp. in the greenhouse, and it was sent me from Boulder, Colorado, by Professor T. D. A. Cockerell, who found it in large numbers upon a lily indoors. I have taken it repeatedly upon *Vinca* and asparagus in greenhouses. Mr. Bragg tells me he has found it colonized upon several other greenhouse plants which he has not noted. It is evidently a very general feeder when abundant. Sexual forms and eggs have not been found. There are many apterous but few alate forms in the College greenhouse at this date, Nov. 20, '07.

Callipterus robiniae, Gillette. (For description see Vol. XXXIX, page 395.)

Winged viviparous female, plate 1, fig. 6; oviparous female, fig. 7; winged male, fig. 8.

This louse is solitary in its habits, and the winged forms are very active jumpers upon being approached. It has been fairly common, but not abundant, upon the under side of the leaves of the black locust in Denver and about Ft. Collins for the past two years. On November 9th, after the leaves had nearly all fallen, I saw the oviparous females with their long-drawn-out abdomens depositing eggs upon rough places in the bark of small limbs of locust trees in Denver parks.

EXPLANATION OF PLATE I.

Figures 1, 2 and 3, alate viviparous female, apterous viviparous female and alate male of *Myzus Braggi*, n. sp. Figures 4 and 5, apterous viviparous female and alate viviparous female of *Myzus vinæ*, n. sp. Figures 6, 7 and 8, alate viviparous female, apterous oviparous female and alate male of *Callipterus robiniae*, n. sp. All enlarged 15 diameters. Original; Miriam A. Palmer artist.

ADDITIONS TO THE LIST OF MANITOBA LEPIDOPTERA.

BY E. FIRMSTONE HEATH, CARTWRIGHT, MAN.

A good many fresh species and some few new to science have been taken in Manitoba since the publication of my list in 1904—additional to that by Mr. A. W. Hanham, then residing in Winnipeg, which appeared in this magazine a few years previously. Before giving my record I may make some remarks upon the appearance, disappearance and apparent migration of some species, which, I trust, will prove interesting.

When first I began to collect here, about 25 years ago, *Pieris protodice*, Bd. and Lec., was the only white butterfly and was abundant. Then a few stragglers of *P. rapæ*, Linn., appeared, and the number of *protodice* became gradually less and less; now it has entirely disappeared, and we have to wage war with *rapæ* in order to grow a few members of the cabbage family in our gardens. Last year this species made a clean sweep where pyrethrum powder was not used. In my own garden it fell back upon a bed of mignonette, greatly to its detriment. In England *rapæ*, with its relative *brassicae*, is kept in check by a small ichneumon fly; here it seems to be unmolested, and it seems desirable to import the parasite.

Colias eurytheme, Stoll., appeared here some years ago and in some numbers. I caught two and saw many more flitting over growing grain, where they could not be followed; none have been seen since.

Vanessa Californica, Bdv., has appeared twice at dates several years apart. *Pyrameis Huntera*, Fabr., is also of very uncertain occurrence.

Some of the Theclas used to be plentiful—now they have all disappeared. Likewise many of the Pamphilas that I used to take are no longer to be found.

Argynnis Edwardsii, Reak., a green-winged species, appeared in numbers some years ago. I took a couple of dozen, and could have taken more. It disappeared as suddenly as it came, and not one was seen during the following season.

With both butterflies and moths—especially the latter—there seems to be a gradual and constant migration from the south west, northwards as far as Manitoba, but very little movement from due east to the westward, or *vice versa*. The cool, high land north of Lake Superior seems to form a barrier to migration from Ontario, and the bare, treeless plains to our west are an obstacle to Albertan species. Still, some forms new to science occasionally appear, and it is a puzzle to know whence they came. In the south-eastern part of this Province there is much roughly-wooded

land, mostly unfit for agriculture, and in it I do not think there is a single collector. The few we have are nearly all in the central portion of the Province, and I alone am near the southern boundary.

I have taken a few specimens during the last two years of *Rhizagrotis perolivalis*, Smith, a species which was, I believe, originally taken near Calgary in Alberta, and during the same years some six or seven examples of *Xylophasia Miniota*, Smith, came to my sugared trees during the early part of June. Miniota, where the first specimens were taken that reached Dr. J. B. Smith, and hence the name, is about the centre of the western boundary of Manitoba. The species is a large and conspicuous one, as large as *Hadena devastatrix*, Brace, and one that could not possibly be overlooked by a collector. It is strange that it should simultaneously appear in two places so far apart.

Euxoa focius, Smith, was taken by me for the first time in 1906.

In, I think, 1884 *Deilephila lineata*, Fabr., was very plentiful, so much so that I only took the trouble to catch two or three. I have not seen it since. The other species, *D. Chamænerii*, Harris, is generally to be seen at bloom in the early summer.

In 1905 I took at sugar about two dozen of *Dargida procinctus*, Grote, prior to which date I have only taken a couple; in 1906 I did not see one. Whole genera have disappeared, but this may in great measure be attributed to the destruction of food-plants by cultivation and by cattle. I have not taken an *Hydrocia* for some years, thanks to my sheep having cleared up all the weeds in the scrub and in the paddocks round about my house. The *Leucanias* and the *Plusias* have also been very scarce lately—probably from the same cause. I do not think I have taken an Arctic imago or seen a larva for the last two or three years; the same may be said of the genus *Schinia*.

The *Chorizagrotis* genus has, on the other hand, come out strongly. I have now taken six out of the eight species listed; during the earlier years of my collecting I rarely met with it. The first species to be captured was *C. introferens*, Grote, and the others followed. With regard to Geometers the case is somewhat different; they may be here, but the weather may be unfavourable for them to come to light or to be much on the wing. The same with the Micros; I have taken hardly any for the last two seasons. In 1906 our few species of *Sphingidae* seemed to have disappeared; perhaps owing to the weather, light had no attraction; at all events, I did not get any, while in some previous seasons they were a perfect nuisance, as I had to kill them off my windows before I could take other things that I wanted.

I have been exchanging a little lately with brother collectors in Saskatchewan and Alberta, and have been much struck by the apparent differences between specimens of the same species taken here and those from localities 500 to 800 miles further west. So much is this the case that Manitoban species, in some instances, are hardly to be recognized at first from descriptions made from western examples.

Besides those mentioned in the following list, I have some six or seven Noctuids which have been seen by Dr. J. B. Smith, and regarding whose names—if they have any—he will give no opinion without further material; among these are two *Polias* and some *Euxoas*. Some of the names in my list are taken from Dr. Fletcher's Record in the Reports of the Entomological Society of Ontario.

I wish again to thank Dr. J. B. Smith for his unvarying patience and kindness in identifying species for us poor collectors out in the wild western country. Where no locality is given in the following list, the species was taken upon my own farm :

Acronycta cretata, Sm.—At sugar in the early part of July. I have taken several specimens during the last three or four years, but never in any large numbers.

Acronycta speratina, Sm.—I understand that Dr. Smith now says that what we had formerly named *sperata*, Grote, is a new species.

Hadena cerivana, Sm.—Several during the last few years, both at bloom and at sugar, but never abundant.

Hadena exhausta, Sm.—Several at sugar in the beginning of July.

Hadena Barnesii, Sm.—Aweme (Criddle), Aug. 22.

Xylophasia Miniota, Sm.—Several at sugar in June; also at Miniota.

Homohadena fifia, Dyar.—More abundant here than the paler *badistriga* with the white secondaries. At light during the summer.

Ancocnemis iricolor, Sm.—At light, Aweme, Sept. 9.

Rhyncagrotis scopeops, Dyar.—Or something very much like it. Several taken with *alternata* at sugar during August.

Rhyncagrotis minimalis, Grote.—At sugar in August; rare.

Rhyncagrotis anchocelioides, Guen.—Formerly listed as *cupida*.

Agrotis aurulenta, Sm.—Aweme, June 16, 1904.

Noctua substrigata, Sm.—Rounthwaite (Marmont).

Chorizagrotis inconcinna, Harv.—Several of this variable species flying about currant bloom, etc., in June.

Rhizagrotis perolivalis, Sm.—Two taken for the first time in 1906 at bloom.

Euxoa foininus, Sm.—Two taken at sugar, July 20; first appearance.

Euxoa acutifrons, Sm.—Two taken at sugar, Aug. 26, 1904, and Sept. 10, 1905.

Anytus profundus, Sm.—With *privatus* at sugar, occasionally.

Fishia Yosemitæ, Grote.

Mamestra juncimacula, Sm.—At sugar in July; scarce.

Mamestra Columbia, Sm.—Listed as *M. meditata*, Grote.

Mamestra Tacoma, Streck.—Sometimes rather plentiful at bloom.

Mamestra cuneata, Grote.—One only, at sugar, July 4, 1904.

Mamestra acuterrima, Sm.—At sugar in July; sometimes plentiful.

Mamestra pensilis, Grote.—Listed as *vicina*, Grote.

Mamestra larissa, Grote.—Listed as *anguina*, Grote.

Leucania multilinea, Walk.—Two or three taken at light.

Xylina innominata, Sm.—Listed as *signosa*, Grote.

Xylina merceda, Sm.—} Plentiful at sugar of late years in Sept.

Xylina ancilla, Sm.—} and Oct.

Papaipema Harrisii, Grote—One only, at sugar.

Orthosia Americana, Morr.—One at sugar, Aug. 8, 1904.

Orthosia helva, Grote.—One at sugar, Sept. 7, 1904.

Orthosia verberata, Sm.—At sugar occasionally with *bicolorago*, Guen.

Nycterophæta luna, Morr.—Aweme, June 23.

Pseudotamila Avemensis, Dyar.—Aweme.

Melicleptria sexata, Sm.—Aweme.

Pæctes oculatrix, Guen.—Aweme, June 20.

Aletia argillacea, Hubn.—One at sugar, Sept. 30, 1905.

Drasteria distincta, Neum.—One or two occasionally.

Syneda Hudsonica, G. & R.—Listed as *Melipotis limbolaris*, Geyer.

Catocala crataegi, Saund.—Fairly abundant at sugar.

Catocala abbreviatella, var. Whitneyi, Dodge.—Rare; only two taken.

Catocala cerogama, Guen.—Two taken for the first time, Aug. 18, 1906.

Catocala verecunda, Hulst.—Rare.

Catocala relicta, Walk.—The white form *bianca*, Hy. Edw., and a very dark form, almost, if not quite, as dark as the Pacific Coast form *elda*, Behr., have been fairly plentiful during the last few years.

Bomolocha latalba, Sm.—About the middle of July, 1905, on the wing about cherry, saskatoon, etc., bushes, with *Chytolita petrealis*, etc.

Prionapteryx nebulifera, Stephen.—Aweme.

NEW HISTORIES AND SPECIES IN PAPAIPEMA (HYDRŒCIA).

BY HENRY BIRD, RYE, N. Y.

(Continued from Vol. XXXIX, page 317.)

It is rather remarkable that in penetrating the seclusion which has so thoroughly surrounded our *Papaipema* species until recently many new specific forms should be met with prior to the discovery of the early histories of some already described. In fact, it seems very much easier to go out and encounter something new and unheard of among their larvae, than to run down in their early stages certain species already long known to us as moths. Of course, in territory as little worked as our great Northwest, with its diversity of elevation and humidity, this might easily occur, but to meet a species new to us in New York City limits that is general throughout the Atlantic States, and even occurs west of the Alleghany Mountains, and is actually a most common insect when we know where to put our finger on it, gives us a better conception of the habits of this secretive genus. So, when another new form first appears at Rye, where for many years a search of presumed diligence has continued, we are reminded how superficial were the endeavours and how little has been seen after all. Two years ago an enigmatic form was bred, and was carried for want of better definition under the label "(?) hybrid," but of what it might be a hybrid did not satisfactorily suggest itself. It soon appeared that there was no ground for considering so prevalent a form a random case of hybridism; its constancy and wide distribution argue against even an environmental variation that might be perpetuating itself. Neither is it suggested by any lapse of superficial character that some allied species wandering to a new food-plant has acquired a new habitus which we do not now recognize. Confronted by these facts, and finding its larva differing from the closest allies, we are able to give specific standing to still another departure in the *Papaipema* group.

Papaipema duplicatus, n. sp.—Form congeneric, front smooth. Ground colour dark brown. Antennæ simple in both sexes; vestiture of thorax and head one shade of grayish-brown with a lilac reflection, the collar having but the faintest paler edging above; the anterior thoracic tuft proportionate, but less adze-shaped than in some species; other tuftings normally present. Primaries have the markings obsolete, excepting the t. a. and the t. p. lines that divide the wing into three slightly

contrasting areas, of which the median space is unduly contracted, and has on the inner margin of the wing less than one-third of this extent, an unusual feature. A slight powdering of glistening-gray scales occurs, but they are more minute and scattered in this species. No basal markings; all inside the t. a. line is grayish-brown with the lilac tinting. The spots are wanting in the median field, which is of a solid brown or umber hue, excepting one specimen of the series, which shows the central, lunulate marking of the reniform, barely defined with grayish scales. The t. p. line is the more evident marking, and is straight or nearly so in its oblique course; it is fasciate rather than geminate, accentuated outwardly by a grayish powdering that affects the whole terminal space; the under colour is the same lilac-gray as the anterior space. The s. t. line is obsolete, or traceable only by a few glistening scales. Subterminal space darkens at the margin. The fringes are silken and slightly dentate. Secondaries pale smoky-brown. Beneath the usual powderings over a lighter ground colour. The structural characters of the male show no departure from the typical form. Expanse, 1.25 to 1.50 inches; 32 to 37 mm.

Co-types are placed in the U. S. National and the British Museums. Seventeen examples, from various points within a four-hundred-mile radius, happen to be at hand for description, but the species is doubtless common throughout the geographical range of its food-plant. It comes closest, perhaps, to *nitela*, but its darker, browner tone easily separates it, and the very late date of flight is a noticeable feature.

The food-plant is *Collinsonia Canadensis*, and the young larvæ do not hatch from the hibernated eggs until the middle of June in this locality. The stem is entered a few inches above ground, where sufficiently tender, and a gallery is extended to the peculiar woody root-stock. But a limited cell is here made, though the last three stages are passed in the root proper, and pupation generally occurs there if the tissues are not broken. The young larvæ are typical with the *nitela* series. In the penultimate stage we find the typical, cylindrical larva, from which the previous darker colouring has faded to a soiled, whitish translucence, and having the continuous dorsal line in evidence. Head, 2.2 mm. wide; chestnut-brown, darker than *nitela*, and with the side marking less distinct. The thoracic and anal plates are also darker, and the tubercles, though small, are better defined than in the ally. While the leg plates bear setæ, there

seems an entire absence of the latter at any tubercle on joints two to ten, inclusive. The accessory plate IVa on joint ten does not appear. Length, 38 to 40 mm.

Maturity shows the larva a little more translucent, with the former characteristics continuing; setæ, however, are now found at the usual plates. It is possible the inflate of the preceding stage may have suffered in preparation, as the hairs ought normally to be present. Head, 2.6 mm. wide; tubercles defined by the merest black dots; IVa absent on joint ten; spiracles small, black. Length, 42 to 45 mm. Pupation occurs Aug. 15 to 21; emergence, Sept. 30 to Oct. 28.

By the difference in colour of the head one may readily separate this larva from either *nitela* or *eupatorii*, and differences of the dorsal line, or the tubercle IVa on joint ten, afford distinguishing features when comparing *necopina*, *imperturbata*, or *nelita*, while it is a month behind the last named species in final developments.

The active, shining, chestnut-brown pupa has no frontal development or other feature out of the ordinary. The anal spur consists of two divergent, slightly curved and very sharp branches. Length, 20 mm.

It has recently developed that one of our *Papaipema* moths is incorrectly determined, and permission has been granted to define this improperly-placed species. Material forwarded to the British Museum to assist a forthcoming volume of the Catalogue of Lepidoptera, contained examples of the presumed *limpida*, of Guenée. Sir Geo. Hampson informs us, however, that the determination is quite in error, that the type, which is there placed, positively represents some other species. This leaves the species we have been calling *limpida* without position, and as it is one which the writer observed in its early stages at Rye, permission for a further treatment affords great pleasure. It had been inferred from Grote's writings that *limpida* was very close to *cerussata*, so it was easy to get this erroneous impression concerning our Speedwell form. The very labour involved in locating and securing bred examples, together with its trim appearance and distinctive larval phases, has quite endeared the species to the writer. Also its rarity as a larva, the extremely local features of its occurrence, which is more a particular plant selection rather than a case of geographical distribution, and its late appearance as a moth, has surrounded the species with an individuality most welcome in a genus necessarily showing many commingling characteristics. During the seven years since the larva was discovered in

one of the few wasteland spots that are left in Rye—and chance, by the way, has not thus far furnished it from other quarters—a continued local search has been made each year, and it is thoroughly known just what particular Speedwell root will give up a larva each year. So scarce are they, however, that four or five specimens per season is the best addition we can make to our series, and it now follows we must have a new name for the old friend.

Papaipema sciata, n. sp.—Ground colour very deep umber-brown, with a tinge of purple lake in fresh material. Head and thoracic vestiture of one deep purple-brown hue ; the abdomen is umber-brown, without the purple inflection. Antennae alike in both sexes, ciliate, the upper and outer sides dark umber, the inner side distinctly white ; a small white scale at the base. The collar has the usual cream-white edging above ; the anterior thoracic tuft erect and spreading at the top ; the posterior one of the usual lesser prominence, its hair-like scales sloping backward at forty-five degrees ; dorsal crests of abdomen normal. Primaries have the costal margin very straight, the markings in some instances are obscure, the chief ornamentation being the cream-white stigmata. Basal spots and area not defined, all within the t. a. line of the purplish shading as the thorax ; the median field deep umber-brown, becoming brighter at the inner margin, where an illumination of red-brown scales often occurs. The median shade line faint, blackish. The t. p. line is geminate, sweeps outward from its costal inception to the lower end of reniform, continuing thence nearly straight to the inner margin. S. t. line appears as an irregular, darker illumination on the glistening purple ground of the terminal and subterminal spaces. Reniform of the normal broken appearance, cream-white. Orbicular and claviform same colour, the latter double, a commingling of two, superimposed, ovate spots ; the axis of this marking forming a more acute angle with the costa than is the case in most species. The usual patch of lighter ground colour at the apex is wanting in the series. Secondaries of a uniform smoky-umber hue, the veins showing darkly. There is some variation in the depth of this colouring. Beneath the wings are heavily powdered with dark scales, the fringes and mesial shade line darkly defined. The male structures, while typical, differ from *duplicatus* and *nitela* in having the lower point of the triangular tip of the harpes less drawn out and tooth-like. The clasper is the same stout, curved claw, with its outer edge minutely roughened like saw-teeth.

Expanse, 1.20 to 1.45 inches ; 30 to 36 mm.

Fourteen specimens, embracing both sexes, are at hand, and others have been reared. Examples bearing a co-type label will be placed in the U. S. National and British Museums, where the species is already represented by specimens from Rye, N. Y. It must have a wide distribution over the Middle Atlantic States, though Webster, N. H., is the only other locality positively recalled. *Sciata* resembles both *cerussata* and *frigida*, but its smaller size, darker tone and absence of white basal spots superficially separate it, while its larva is entirely different. For description of the latter, with notes of early history, consult this magazine (CAN. ENT., Vol. XXXIII, p. 64). Correspondents will now bear in mind the change in the *limpida* label.

There seems reason for the introduction of two other species at this time, in view of forthcoming literature, so that our list may be as fully up to date as possible. One of these is a Pacific Coast form, the other an eastern one, which probably has a boreal tendency. While it might have been better to await a larval acquaintance, it is feared this desideratum may be too remote to be waited for.

Papaipema imperspicua, n. sp.—Form congeneric, front smooth. Ground colour yellowish-brown. Antennæ minutely ciliate, no white scales at base. Head and thorax purple-brown, the erect tuft spreading at the top, posterior tuft and the abdominal ones also normal. Basal spots indistinct, of the ground colour. T. a. line geminate, of the usual sinuous course, but its lower section bends outwardly and encloses more area than is usual; this area is an even, dull purple. The t. p. line is distinctly geminate and even in its course, the inner line a fine brown lunulate marking. It has an angled bend as it passes the reniform, rather than the broad sweep which is common to so many. The median field is yellowish-brown, the lower part yellower and brighter. The shade line is distinct and of a deep brown. The central marking of the reniform is all that appears, defined in a lighter hue of the ground colour. Orbicular and claviform wanting. The s. t. line is a fine lunulate yellow marking; at the costal tip there is outwardly a yellow dash. The terminal space is the even shade of purple which holds inside the t. a. line, the subterminal space is yellowish-brown again. Secondaries even smoky-brown. The male structures agree with the pattern of *nitela*, the outwardly dentate harpes with a prolonged lower lobe, and the heavy spinulated tip, follow the common design. Expanse, 1.50 in.; 37 mm.

The species in a way resembles *unimoda* and *frigida*, but the sexual characters preclude such an association. With *cerussata* there may be a closer bond, but the latter has been seen with concolorous stigmata, and this phase of its variation is understood. The type is from Mrs. A. T. Slosson, taken at Franconia, N. H., a locality renowned for the multitude and value of its disclosures. Buffalo, N. Y., is another locality for the species.

Paprirena limata, n. sp.—Form congeneric, front smooth, pattern conventional. Vestiture of head and thorax yellow, overlaid with pinkish scales; the tufts normal. Antennæ simple. Wings are a little narrow; ground colour bright lemon-yellow. The absence of powderings on the primaries makes them appear more thinly scaled than usual. Basal area defined and of the ground colour. T. a. line incomplete, in the lower half of its course lost entirely. The area it encloses is small and of the dull pink which replaces, in this case, the usual purple markings. The t. p. line is double, though the inner one is extremely fine; the outer is well shown, is the most noticeable of any transverse marking, curves outwardly past the reniform, from which it is well removed and defines a median field of good proportion, brightly coloured with the ground shade. The shade line is wanting, but a washing of the pinkish hue holds between the orbicular and reniform. The latter is broken, restricted in length, its axis is one-third less than that of the other combined spots and is pure white. The claviform and orbicular are large and brightly white, the former consisting of two confluent ovate spots, the latter a larger ovate spot. The terminal space is pink, the subterminal yellow, but there is no definite line dividing the two. The secondaries are paler yellowish and very silken. The beautiful silken fringes are a little pinker than the adjoining wing. Underneath of the same pale yellow, with pink powderings.

The type specimen comes to hand through the courtesy of Prof. J. B. Smith, and bears the locality label of the Washington Experiment Station, Pullman, Wash., date Sept. 25th, 1898, but the name of the collector is wanting. The species has no very close counterpart in the east, and approaches somewhat *insulidens*, which comes from Vancouver Island, but its lighter tone and markings sufficiently differentiate it. While the antennæ and abdomen are broken, the specimen is in good condition otherwise, and may well stand as the type to represent the species.

A FOSSIL LEAF-CUTTING BEE.

BY T. D. A. COCKERELL, UNIVERSITY OF COLORADO.

In the course of our excavations at Florissant, we had found more than once fossil leaves cut as though by *Megachile*. Yet we did not feel positive that the injury might not have been produced in some other manner, and it was certainly not permissible to assume the former presence of *Megachile* on such slender evidence. However, in going over the collections of 1907, I now find a veritable leaf-cutting bee, herewith described :

Megachile prædicta, n. sp.

♀.—Length (with the head thrust forward) 11 mm.; width of head 3, of thorax 4, of abdomen $3\frac{1}{5}$ mm.; abdomen oval, its length about 5 mm.; the dense ventral scopula can be clearly seen with the compound microscope, and the apical depressions of the segments are visible and quite normal. Head and thorax black, abdomen red. As preserved, the wings are also red, but this is due to a ferruginous infiltration. The abdomen is no doubt stained in the same way, but since it was evidently not black, it was presumably red, as in the Australian *M. abdominalis*, Smith. Head and thorax strongly and extremely closely punctured; punctures on front considerably larger than those on mesothorax; clypeus densely punctured; inner orbits straight, somewhat converging below; ocelli large, in a curve; a groove runs downward from the middle ocellus. Anterior wing about 7 mm. long (the tip not visible); venation quite normal; stigma large for a *Megachile*; marginal cell rather obtusely pointed, away from costa; basal nervure ending a little behind (apicad of) transverso-medial; second transverso-cubital with a double curve; second recurrent nervure gently and evenly curved outwards, and ending a little before tip of second submarginal cell, the cell being rounded, not angulate, at its lower outer corner; lower part of basal nervure quite strongly curved.

The following measurements are in micromillimeters :

Depth of stigma, 238; length of marginal cell, 2006; width of marginal, 510; length of first submarginal, 1343; of second submarginal, 1122; of first discoidal, 1921; basal nervure on first s. m. about 340; b. n. on first discoidal, 935 (or rather more, allowing for curve); b. n. short of t. m. about 68; length of first t. c., 340; origin of first t. c. to insertion of first r. n., 102; insertion of first r. n. to insertion of second, 986; insertion of second r. n. to corner of second s. m. about 68; insertion

of second t. c. on marginal to apex of latter, 935; length of first r. n., 969; diameter of second discoidal cell at apex, 663; diameter of ocelli about 255; distance between middle and lateral ocelli about 170. The t. m. nervure is straight, scarcely oblique, 306 long.

Miocene shales of Florissant, Colorado, Station 14 (*W. P. Cockerell, 1907*).

This is the first fossil *Megachile*. A nameless *Chalicodoma* was said by Brischke (1886) to occur in Prussian amber.

MOSQUITO NOTES.—No. 6.

BY C. S. LUDLOW, M. SC., WASHINGTON, D. C.

Laboratory of the Office of the Surgeon-General, U. S. Army, Washington, D. C.

In a collection of mosquitoes from the Philippine Islands, received with no locality or date attached, is a most interesting lot of *Stegomyia fasciata (calopus)*.

In all cases the thoracic markings are those of the type, sometimes those of var. *mosquito*, Desv.; the leg markings are normal; the cephalic markings vary from normal to an almost entirely pure white head, and the abdomen from the normal to a pure white (dorsal surface) abdomen. All grades of this latter peculiarity are present, some specimens having only additional apical bands on the segments, some showing a continuous median white stripe, some with all the segments but the 6th and 7th pure white, while a few have the whole of the dorsal aspect of the abdomen, pure white, with the exception of a small lateral brown spot on the last segment. In a collection of about forty specimens twenty-one showed some form of these variations. Once before I had one specimen of this species with a white abdomen, and I have also reported one specimen with one hind leg normal and the other lacking the white bands, but a lot like this has never reached me before. There has also been received a new *Cellia*—a genus not before reported from the Philippines.

Cellia flava, n. sp.—Female. Head dark, covered mostly with light yellow or white forked scales, a few brown ones laterad and ventrad, a heavy bunch of very long, slender white curved scales projecting forward between the eyes, some brown bristles around the eyes; antennæ almost white, a minute brown band at the base of each row of verticels, verticels and pubescence white; palpi almost white, basal joint testaceous, the distal half covered with yellow and white scales, i.e., the apex with a broad band of white followed by a broad yellow band, a minute brown basal

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band on the ultimate and penultimate joints, the antepenultimate is distally white, then a broad yellow band occupying most of the joint, a narrow basal brown band, and the remainder of the palpi heavily scaled by brown with some intermixture of yellow scales. Proboscis light, base heavily brown scaled, then a mottled portion extending to the distal third, which is covered with light yellow scales, except a narrow brown band at its extremity, labella light orange; clypeus testaceous; eyes brown.

Thorax: prothoracic lobes testaceous, covered with light and brown flat spatulate scales; mesonotum light and delicate, with two small submedian or laterad brown spots (not scaled) about one-third the length of the mesonotum from the head, sometimes another pair just cephalad-laterad to these, a suggestion of a brown median line, the whole (except spots) covered with white slender hair-like curved scales, a few small flat curved or spatulate scales scattered throughout, more noticeable laterad, especially cephalad of the wing joint, and at the nape growing into a tuft of long flat curved spatulate scales, a dark median spot in front of the scutellum; scutellum dark in the middle, side light, brown bristles; pleura light, with some brown lines; metanotum light, with median brown stripe.

Abdomen light or dirty gray, sparsely covered with long flat spatulate white or yellow scales and white or light yellow bristles, heavy lateral tufts of long brown broadly truncate scales on most (6) of the segments, the last segment more heavily white scaled.

Legs: coxae light, sparsely covered with long spatulate white scales, and white bristles; trochanters light, mostly brown scaled; femora of the fore legs somewhat thickened at the base, in all legs covered with irregular bands or spots of brown and white, and have a very narrow white apical band; tibiae mottled in the same way, first tarsal (metatarsi) joint also mottled, and has narrow apical light bands more marked on the hind legs; remainder of tarsal joints on fore and mid legs more or less distinctly mottled and having narrow apical light bands; on the hind legs the second tarsal has a broad apical white band, the third broad apical and basal white bands; the fourth and fifth marked in the same way; unguis simple and equal.

Wings light, and mostly light scaled, on the costa are two tiny basal dark spots, four large brown spots, and a tiny brown spot between the two more proximal larger spots; all of which extend on the first long vein, and an analogous intermediate spot on the first long vein. Wing-field somewhat spotted, but mostly light scaled; a dark spot on each fork

of the second long vein, third long vein light except small spots at the apex and near its base, two small spots on the forks of the fourth, and a couple on the stem, three small spots on upper fork of fifth, one on the lower fork, stem light except that close to the base is a small dark spot, sixth has three small spots, and the wing fringe is spotted between the junctions of every vein.

Length 3.5 mm. 5 mm. with proboscis.

Male, much as female. On the antennæ the bands at the bases of the verticels are more yellow; the palpi are not so distinctly marked, there being a narrow brown band in the middle of the "club," a white band followed by yellow at the apex of the penultimate, with a brown spot on one side and a very narrow basal brown band, the antepenultimate has the light and dark bands rather irregularly placed and a tiny narrow white band at the base (in one specimen this is nude). The leg markings are perhaps more brilliant; fore unguis markedly unequal, the larger with a long tooth.

Habitat—Camp Wilhelm, Tayubar, P. I.

Taken Sept., 1907.

Described from four specimens collected by the Surgeon on duty at this Port. It is a very unusual looking Anophiline, and its colouring is very attractive.

A SUGGESTION REGARDING DEVELOPMENT RETARDED BY PARASITISM.

BY L. O. HOWARD, WASHINGTON, D. C.

In volume V. of the Hope Reports, Professor Poulton republishes an article by Mr. F. P. Dodd, entitled, "Notes on Some Remarkable Parasitic Insects from North Queensland," which was originally published in the Transactions of the Entomological Society of London, for May, 1906, Part I. In this article, among other interesting things, Mr. Dodd shows definitely that *Schizaspidia* and *Rhipipallus* of the Eucharidæ are true parasites of ants. But the observation to which I wish particularly to call attention is Mr. Poulton's comment upon Mr. Dodd's observations that indicate a remarkable and long-persistent vitality in larvae attacked by Braconid parasites. Mr. Poulton says: "It is probable that within hot latitudes, where a dead insect would quickly dry up and in other ways deteriorate as food, the attacks of parasites have been specially adapted to

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prolong the victim's life to its very utmost. The adaptation, of course, always exists, but here we probably see it at its highest level."

This retardation is by no means confined to Braconid parasites, but also occurs with other parasites, and, as Mr. Poulton suggests, in other than hot latitudes. I recall very well some observations which Mr. Schwarz and I made on the larvae of *Plusia brassica* in cabbage fields in Washington in 1881. It was in the autumn, and full-grown larvae of this insect were rather abundant in the fields. Fifty or more specimens were taken to the laboratory, and showed an almost complete percentage of parasitism by *Copidosoma truncatellum*.

Some of the observations made at that time were recorded by me in the American Naturalist for February, 1882, pp. 150-1, and also in the Annual Report of the Department of Agriculture for 1883, p. 121. I believed then, and I think Mr. Schwarz concurred (although neither of us ever published the statement), that this practically complete percentage of parasitism was not necessarily indicative of the whole percentage for the season, but indicated that the parasitized larvae remained longer in the field, and without ocular evidence of parasitism for a considerable time after the unparasitized individuals had spun up and transformed to chrysalids.

In fact, it frequently occurs with lepidopterous larvae, and, of course, with other insects as well, that parasitized individuals grow more slowly than the rest, and often may be identified by their smaller size. Many, as we know, are destroyed before reaching full growth by certain parasites, but many others reach the full larval size and linger on, sluggish it may be, but apparently unharmed for a considerable time after their unstung mates have crawled away and hidden themselves for transformation, or even perhaps, in case of multiple-brooded species, until individuals of a succeeding generation have approximated their stage of growth.

The practical feature of all this in work with parasites comes from the fact that we must take this retardation strictly into consideration in estimating percentages of parasitism. Should larvae in considerable number be collected at the end of the season and kept for rearing purposes, it appears that through this retardation of parasitized individuals it may easily happen that an apparently almost complete percentage of parasitism will be observed which will by no means indicate the true percentage with the generation as a whole.

LAMPYRIDES AND APHIDS.

BY ERIC MONTIZAMBERT, PORT HOPE, ONT.

The great value of the Lampyridæ as destroyers of various insect nuisances in their larval stages is too well known to need comment, but I doubt if many persons are aware that at least one species of this sub-order has a particular relish for a certain aphid.

On June 8th, 1906, I was attracted by swarms of insects to a clump of Golden-rod (*Solidago Canadensis*); on drawing nearer I discovered that the insects were Lampyrids of a common species (*Telephorus carolinus*). Hundreds were swarming over the plant, and this fact caused me to look more closely. Upon doing so I discovered that they were greedily devouring the big red aphids which were very common on Solidago about here. The beetle would seize the aphid from the rear with his mandibles and front feet, and in a few seconds would leave him sucked dry. The number of aphids destroyed in this manner was enormous. When I visited the plant the next day I saw nothing but hundreds of dried-up aphid skins; no beetles were visible. The aphid was *Siphonophora rudbeckiae*.

A week later I noticed the same occurrence at a place eleven miles distant. The insects were identified for me by Dr. Fletcher, of Ottawa.

STHENOPIS THULE.

To the Editor of the "Canadian Entomologist":

SIR,—I cannot allow the note of censure appended by you to my paper on "Collecting Sthenopis Thule," in the December number, to pass unchallenged, as I feel that it is undeserved.

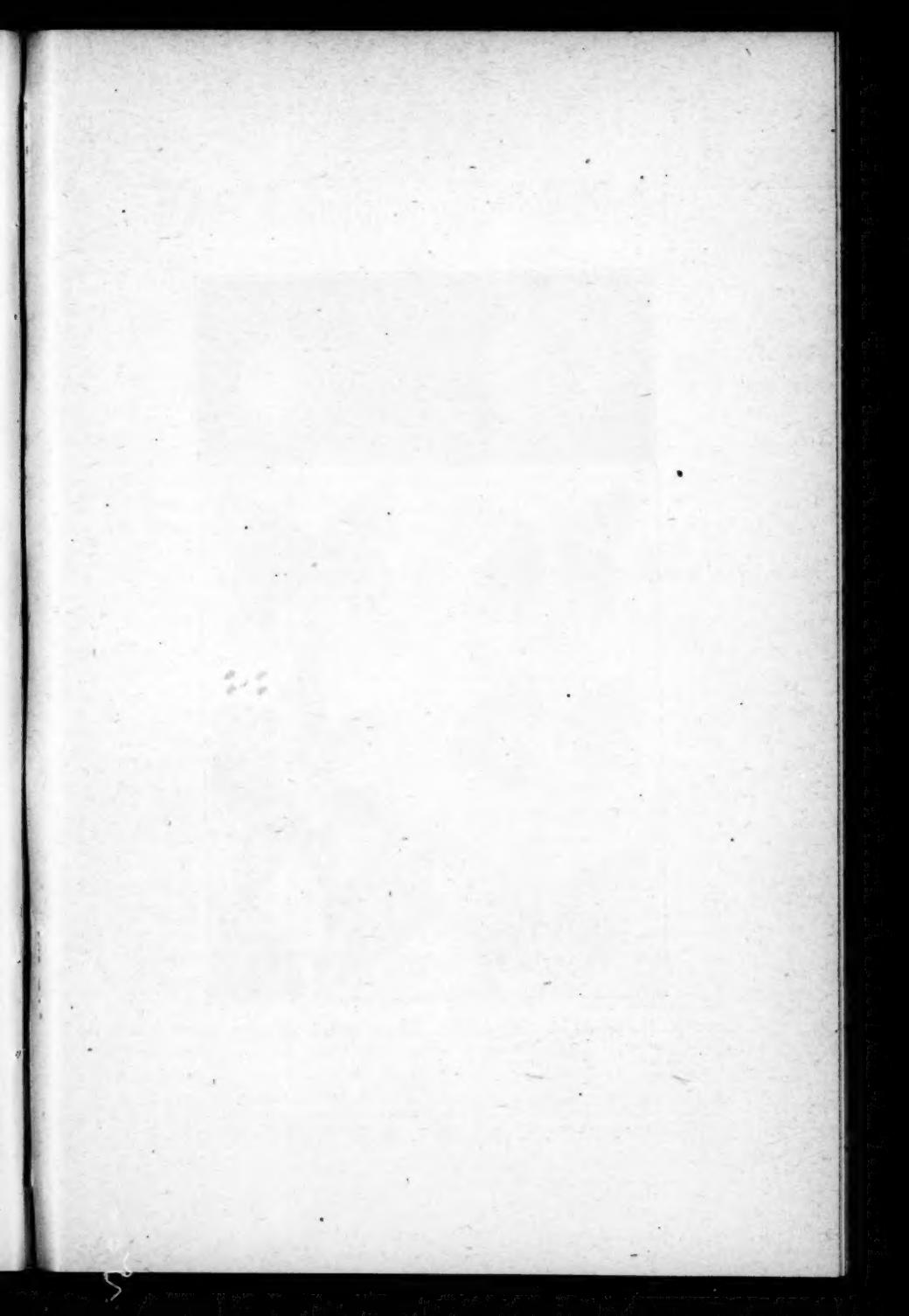
The former supposed great rarity of this moth was due to our ignorance of the food-plant, and, therefore, of the proper localities in which to look for it. As to its supposed restriction of range, it is inconceivable that a moth which feeds upon so common and generally distributed a tree as the willow, and which produces such an enormous number of eggs, could really be restricted to a very limited locality. Mr. Lyman found a specimen in the British Museum which had been received from Mr. Barnston, and was supposed to have been taken, along with other specimens, at St. Martin's Falls, on the Albany river. If it was really taken there, it shows a very wide distribution to the north, but even if that specimen was taken at Montreal, as has been privately suggested, there is still the statement of Dr. Strecker that he had received a drawing of one taken in Wisconsin, which would show a wide distribution to the west.

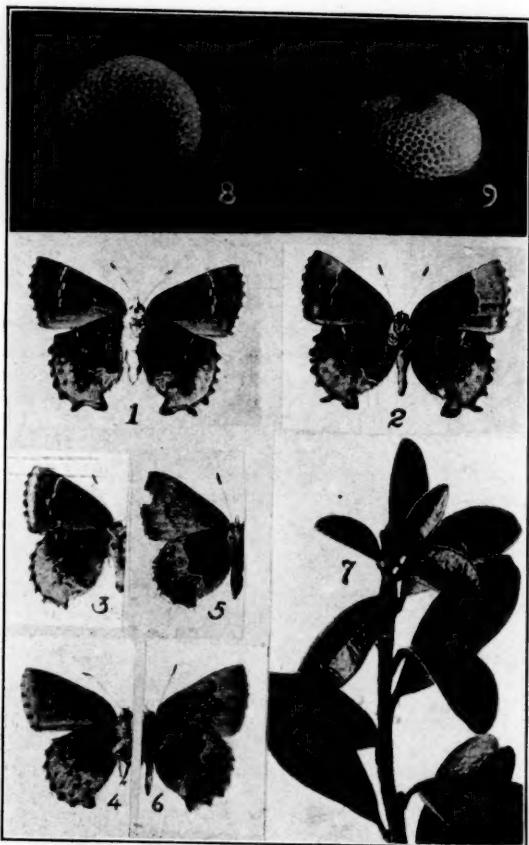
That it has not been taken to the south may indicate a northern range, and I believe that it will be found in a northerly and north-westerly direction, if looked for in its season where willow scrub abounds. It should also be remembered that as its season is so short, it probably mates immediately, and oviposits very early.

It should also be remembered, as Dr. Knaggs points out in his "Guide," that a moth which flies in the dusk of the evening will also, under favourable circumstances, fly in the dusk of the dawn, when it will be free from molestation by even the most greedy collector.

200 Mitcheson St., Montreal, Dec. 24th, 1907. EDWARD DENNY.

Mailed January 8th, 1908.





INCISALIA POLIOS—EGGS AND ALLIES.

